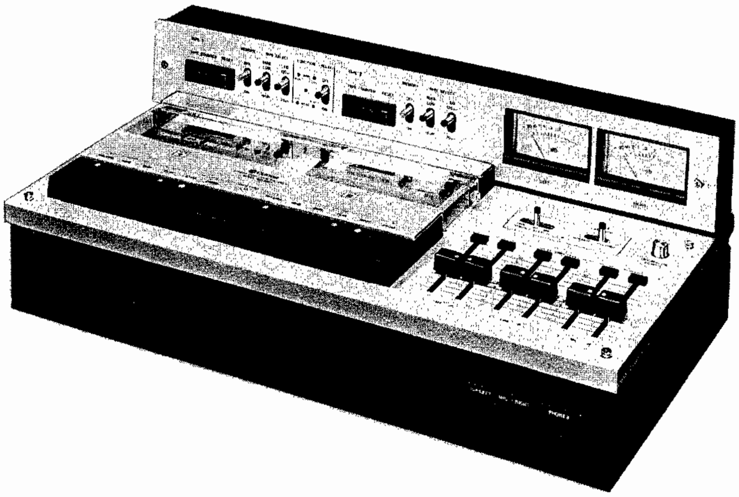
Clarion

SERVICE MANUAL

Closer Relations through CLARION SERVICE MANUAL

MODEL MD-8181G

Manufacturer **CLARION CO., LTD.** / Export Division **CLARION SHOJI CO., LTD.**
3, Kojimachi 5-chome, Chiyoda-ku, Tokyo, 102 Japan Tel: (265) 2931 Telex: J22908, J22152 CLARISHO
Overseas Sales Branch Offices:
CLARION SHOJI (EUROPA) G.m.b.H. Rudolf-Diesel-Strasse 2, 6236 Eschborn 2, West Germany Tel: 06173-61041-42 Telex: 415414
CLARION CORPORATION OF AMERICA 5500 Rosecrans Blvd.P.O.Box 749, Lawndale, Calif., 90260 U.S.A. Tel: 213-973-1100 Telex: CLARIONLSA 66-4447
CLARION (HONG KONG) CO., LTD, Rooms 333-335, Star House, 3, Salisbury Road, Tsimshatsui, Kowloon, Hong Kong Tel: 3-695393 Telex: SIERA HX74922



■SPECIFICATION:

Type:	Stereo dual cassette deck
System:	4-track 2-channel stereo system
Tape speed:	4.8cm/sec
Wow and flutter:	0.08%(WRMS) ±0.14%(DIN)
Frequency characteristic:	20Hz to 17KHz (with chrome tape) 20Hz to 17KHz (with double coating tape) 20Hz to 15KHz (with low noise tape)
Distortion:	Less than 2.0%
S/N ratio:	53dB (61dB when Dolby N.R. unit is used)
Recording system:	AC bias (105KHz)
Erasing system:	AC erasing
Fast forward, rewind time:	Within 95 sec (C-60)

Input terminals:	MIC	0.9mV	10KΩ
	LINE IN	90mV	100KΩ
	REC/PB	2.25mV	10KΩ

Output terminals:	LINE OUT	400mV	5.6KΩ
	REC/PB	400mV	5.6KΩ
	PHONES	0.3mW	
	(Headphones impedance: 8Ω)		
Accessory terminals:			
	PLAY BACK IN	400mV	50KΩ
	PLAY BACK OUT	400mV	5.6KΩ
	RECORD IN	400mV	50KΩ
	RECORD OUT	400mV	5.6KΩ

Semiconductors:	97 transistors, 44 diodes, 5 LEDs
Power requirement:	AC 117V 60Hz AC 220V 50Hz AC 240V 50Hz
Power consumption:	15W
Dimensions:	(H) 160mm (6-19/64") (W) 460mm (18-7/64") (D) 247mm (9-23/32")
Weight:	Approx. 7.5kg (16.5 lbs.)

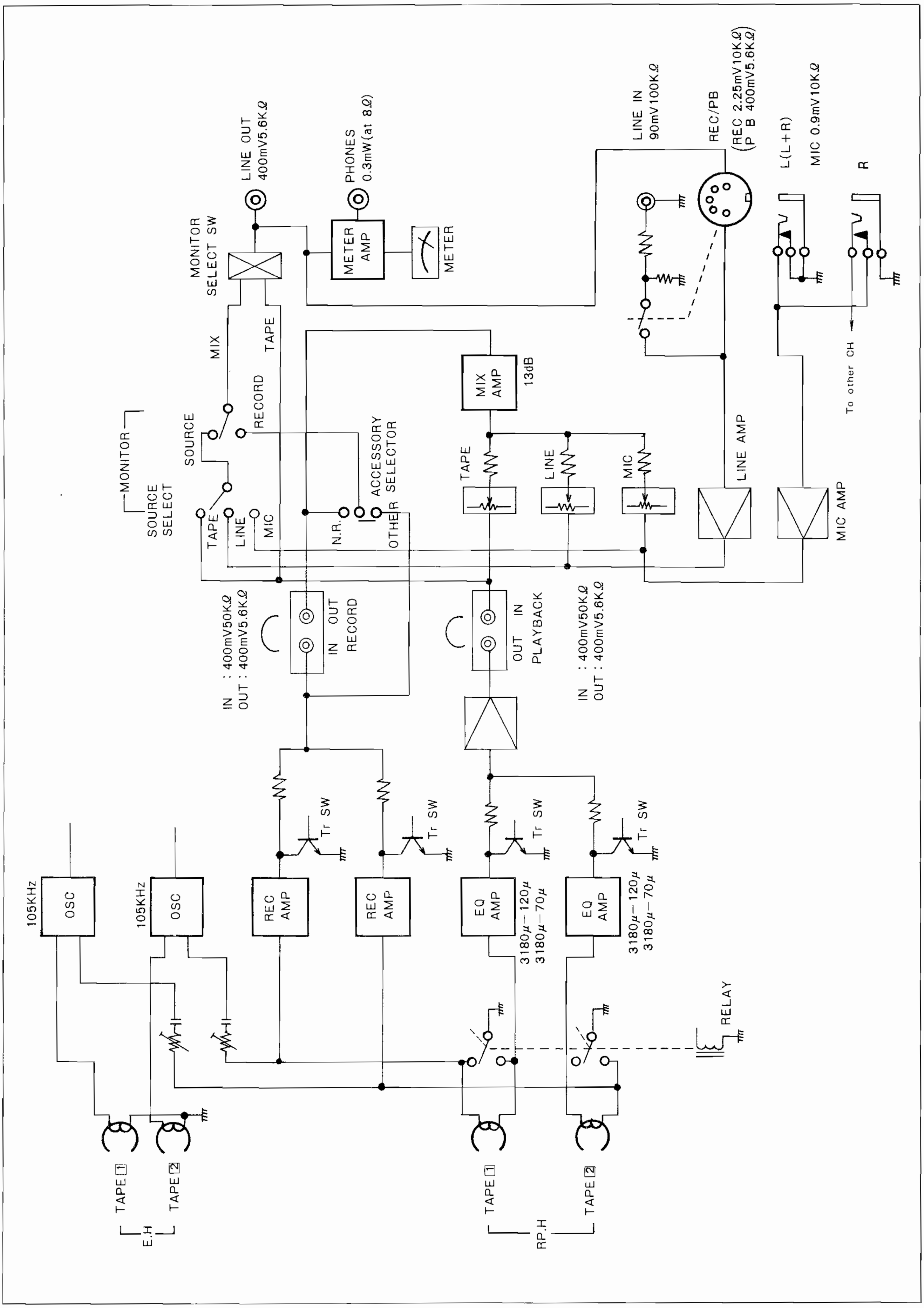
∗(Dolby) is the trade mark of the Dolby Laboratories.

Printed in Japan 298-2112-00

FEATURES:

- **Dual cassette tape deck**
  The MD-8181G contains two recording and playback mechanisms and so it offers a previously unavailable flexibility and convenience in dubbing, mixing, on-air recording and other applications.
- **Continuous recording, continuous playback**
  Using its two mechanisms, the MD-8181G first records and plays back on TAPE 1, and then automatically switches over for recording and playback on TAPE 2 for lengthy recording and playback.
- **Easy dubbing system**
  Dubbing can be performed from TAPE 1 to TAPE 2, or from TAPE 2 to TAPE 1. This eliminates all the trouble of ejecting and re-loading tapes.
- **Built-in timer start mechanism**
  By setting the timer, the MD-8181G can be automatically programmed to record and playback a program. Also, by making use of the multi-movement timer, the deck can be programmed to start TAPE 1 and TAPE 2 at different times.
- **Full-scale mixing capability**
  The MD-8181G is equipped with a 3-system mixing capability: LINE IN, MIC and TAPE, which means you can enjoy full-scale mixing as never before.
  You can also check the quality of the mixing and the state of each of the inputs by flipping a monitor switch.
- **Memory stop mechanism**
  The MD-8181G comes with a memory stop mechanism that stops the tape during rewind at the desired position. This means that you can use this mechanism to play back the same portion of a tape over and over again, and also to find the start of a desired program.
- **Automatic stop mechanism**
  This deck is provided with an electronic full-auto stop mechanism. When the tape comes to the end, this mechanism swings into action automatically to release the deck from its operating mode.
- **LED indication**
  The deck's five LEDs (light-emitting diodes) indicate the functions of the deck. You can therefore tell at a glance whether the deck is set to recording, playback, dubbing, continuous recording, or continuous playback.
- **Two-channel recording with a single microphone**
  By plugging a microphone into the left channel microphone jack, you can record in mono with both the left and right channels.
- **High-precision mechanisms**
  The MD-8181G adopts large-sized flywheels for really superior tape run stability.
- **Separate bias, equalizer tape selectors**
  The MD-8181G is provided with separate bias and equalizer selectors so that the deck can be used to the full with any kind of tape.
- **Accessory connecting terminals**
  There are accessory connecting terminals for Dolby noise reduction units and others. This means that you can enjoy the sound from your deck with an improved signal-to-noise ratio or with a greater degree of flexibility in operation.
- **Level markers**
  Also featured are level markers which are useful when recording or editing. Set them to the position corresponding to the setting of the level controls.
- **Removable cassette cover**
  You can remove the cassette cover if you are unloading, replacing and re-loading tapes at frequent intervals.

■BLOCK DIAGRAM:


LINE OUT
400mV5.6KΩ
PHONES
0.3mW(at 8Ω)
LINE IN
90mV100KΩ
REC/PB
(REC 2.25mV10KΩ)
(P B 400mV5.6KΩ)
L(L+R)
MIC 0.9mV10KΩ
R
MONITOR
SELECT SW
METER
AMP
METER
MIX
TAPE
MIX
AMP
13dB
To other CH
MONITOR
SOURCE
SELECT
SOURCE
RECORD
ACCESSORY
SELECTOR
TAPE
LINE
MIC
N.R.
OTHER
TAPE
LINE
MIC
LINE AMP
MIC AMP
IN : 400mV50KΩ
OUT : 400mV5.6KΩ
IN
OUT
RECORD
OUT
IN
PLAYBACK
IN : 400mV50KΩ
OUT : 400mV5.6KΩ
Tr SW
Tr SW
Tr SW
Tr SW
105KHz
OSC
105KHz
OSC
REC
AMP
REC
AMP
EQ
AMP
3180μ−120μ
3180μ−70μ
EQ
AMP
3180μ−120μ
3180μ−70μ
RELAY
TAPE 1
TAPE 2
E.H
TAPE 1
TAPE 2
RP.H

■ADJUSTMENT PROCEDURE:

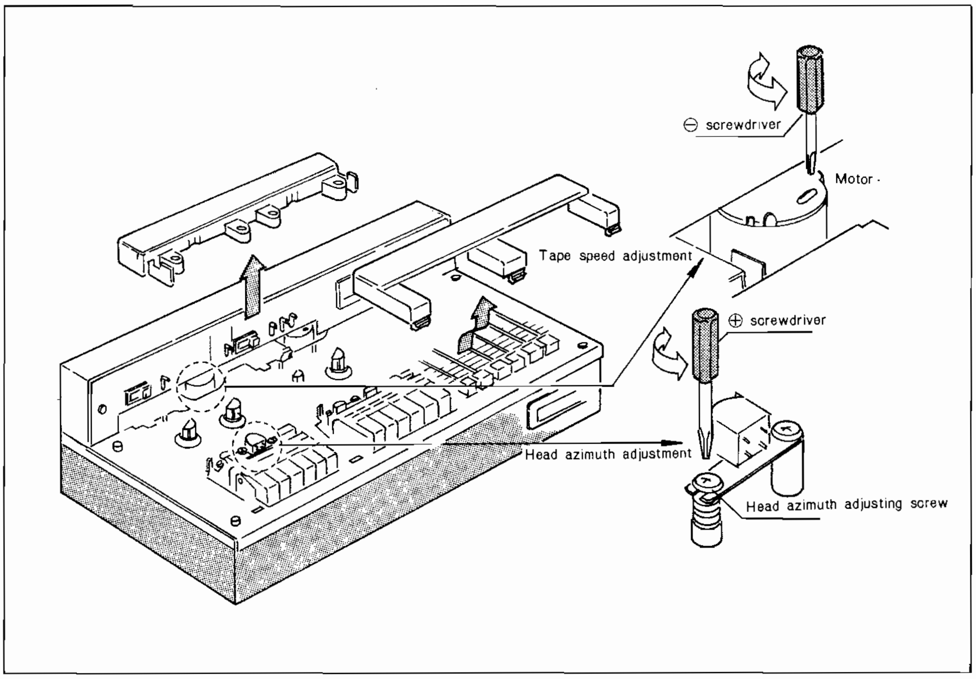
Adj. Sequence	Adjustment Item	Adj. Value	Test Tape	Adjustment Point	Measuring Terminal	Measuring Instrument	Condition	Remarks
1	Tape speed	3030Hz	3KHz–10VU (25mM) CTT-422-100	TAPE$\boxed{1}$, TAPE$\boxed{2}$ motor upper part	LINE OUT terminal	Frequency counter		Difference between speeds of TAPE$\boxed{1}$ and TAPE$\boxed{2}$ must be less than 2%.
2	Head azimuth	LEFT, RIGHT channel maximum point	8KHz–10VU (25mM) CTT-422-113	TAPE$\boxed{1}$, TAPE$\boxed{2}$ head	LINE OUT terminal	Millivoltmeter		After performing the adjustment be sure to lock the screw
3	Playback gain	400mV	400Hz0VU (200nwb/m) CTT-422-112	VR_{603},VR_{604} VR_{703},VR_{704} (500Ω)	PLAYBACK OUT terminal	Millivoltmeter		These two items must be adjusted alternately.
4	Playback frequency response	0dB (8KHz)	8KHz–10VU (25mM) CTT-422-113 333Hz–10VU (25mM)	VR_{605},VR_{606} VR_{705},VR_{706} (30KΩ)	PLAYBACK OUT terminal	Millivoltmeter	Set the tape selector to low noise tape position.	
5	Level meter sensitivity	0dB	400Hz0VU (200nwb/m) CTT-422-112	VR_{101},VR_{102} (1KΩ)	(Level meter)			
6	Recording bias trap	Minimum	Recording tape (not specified)	L_{605},L_{606} L_{705},L_{706}	TP_6,TP_6 TP_7,TP_8	Millivoltmeter		
7	Recording bias current	Approx. 4.5mV (across 10Ω terminals)	Recording tape (not specified)	VR_{607},VR_{608} VR_{707},VR_{708} (100KΩ)	TP_1,TP_2 TP_3,TP_4	Millivoltmeter	Set the tape selector to low noise tape position.	
8	Recording gain	400mV (at Rec./Play)	MAXELL UD C-60 (unrecorded tape) CTT-422-114	VR_{601},VR_{602} VR_{701},VR_{702} (30KΩ)	LINE IN LINE OUT	Oscillator Millivoltmeter	Set the tape selector to low noise tape position.	Record at LINE OUT output 400Hz 400mV.
	NOTE)	Recording bias current has relationship with Rec./Play frequency response. Therefore, after adjusting the recording bias current check the recording/playback frequency response. (In some cases it may be necessary to readjust the recording bias current.)						

$\boxed{1}$ Adjusting Test Speed

Play the test tape (3KHz–10VU) and adjust the speed adjuster of the motor to obtain 3030Hz.

$\boxed{2}$ Adjusting Head Azimuth

Play the test tape (8KHz–10VU) and adjust the head azimuth adjusting screw so that left and right outputs become maximum.



3 Adjusting Playback Gain

Take off the shorting pin (PLAY BACK) located at the rear panel. Play the test tape (400Hz 0VU 200nwb/m) and adjust the semifixed control so that the PLAY BACK OUT terminal output becomes 400mV.

4 Adjusting Playback Frequency Response

Take off the shorting pin (PLAY BACK) located at the rear panel. Play the test tape (333Hz—10VU) and consider the output at this time as 0dB. Next play the test tape (8KHz—10VU) and adjust the semifixed control so that the output becomes the same 0dB.

NOTE) When the playback frequency response is adjusted, the playback gain may change. Therefore, perform the adjustments of items 3 and 4 alternately.

5 Adjusting Level Meter Sensitivity

Play the test tape (400Hz 0VU 200nwb/m) and adjust the semifixed control so that the level meter indicates 0dB.

6 Adjusting Recording Bias Trap

Set MD-8181G to recording state, connect a millivoltmeter to the test point and adjust the recording bias trap adjusting coil so that the deflection in the millivoltmeter becomes minimum.

7 Adjusting Recording Bias Current

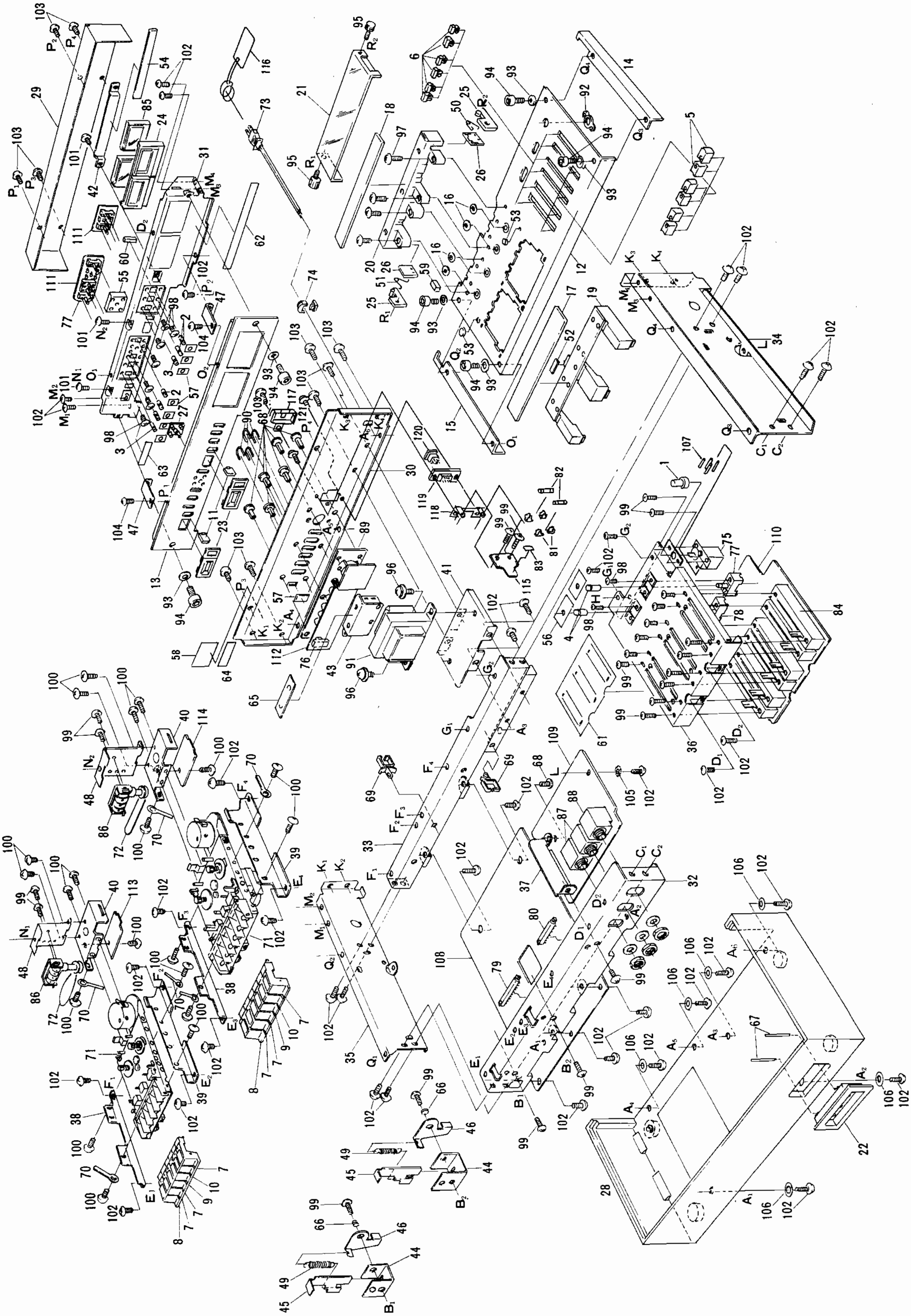
Set MD-8181G to recording state, connect a millivoltmeter to the test point and set the tape selector to the low noise tape position. Now adjust the semifixed recording bias adjusting control so that the millivoltmeter reads 4.5mV.

8 Adjusting Recording Gain

Load the recording tape (MAXELL UD C-60) and apply a signal of 400Hz 400mV from the oscillator to the LINE IN terminal. Next set MD-8181G to recording state, adjust so that the recording monitor output becomes 400mV, set the tape selector to the low noise tape position, and perform recording. Playback the recorded signal and adjust the semifixed control so that the playback output becomes 400mV. Since this adjustment is not possible by adjusting only once, perform the adjustment a few times.

■EXPLODED VIEW:

◎Main section



■PARTS LIST:

◎Main section

REF.NO.	PART NO.	DESCRIPTION	RANK
1	380-3435-00	Knob	2
2	380-3668-00	Knob	2
3	380-3668-01	Knob	2
4	380-3669-00	Knob	2
5	380-3670-00	Knob	2
6	380-3671-00	Knob	2
7	382-0125-01	Button	2
8	382-0125-02	Button(Red)	2
9	382-0125-03	Button(Green)	2
10	382-0125-04	Button(White)	2
11	382-0126-00	Button	2
12	370-3094-00	Escutcheon	
13	370-3095-00	Escutcheon	
14	371-2679-00	Trim plate (Use R side)	
15	371-2679-01	Trim plate (Use L side)	
16	371-2680-00	Trim plate	
17	371-2681-00	Trim plate (Use head cover)	
18	371-2682-00	Trim plate (Use motor cover)	
19	335-0906-00	Head cover	
20	335-0907-00	Motor cover	
21	335-0908-00	Dust cover	
22	335-0909-00	Jack cover	
23	335-0910-00	Counter cover	
24	335-0911-00	Meter cover	
25	335-0916-00	Dust cover arm	
26	335-0917-00	Dust cover fulcrum plate	
27	375-0600-00	Pilotlamp accessory	
28	319-0063-00	Cabinet	
29	310-0905-00	Upper case	
30	307-0271-01	Rear cover	
31	309-0313-00	Front plate	
32	312-0174-00	Chassis	
33	312-0175-00	Chassis	
34	312-0176-00	Chassis	
35	312-0176-01	Chassis	
36	312-0176-00	Chassis	
37	330-5813-00	Jack PWB mounting bracket	
38	330-6240-00	Mechanism mounting bracket	
39	330-6241-00	Mechanism mounting bracket	
40	330-6242-00	PWB mounting bracket	
41	330-6243-00	Power trans mounting bracket	
42	330-6244-00	Meter holder	
43	330-6245-00	Shielded case	
44	330-6246-00	SW lever bracket	
45	330-6247-00	Press lever	
46	330-6248-00	Rotary lever	
47	330-6249-00	Upper case bracket	
48	330-6250-00	Counter bracket	
49	750-1823-00	Spring	
50	750-1855-00	Spring	
51	750-1855-01	Spring	
52	345-2869-00	Cover cushion	
53	345-2846-00	Cover cushion	
54	345-2845-00	Meter cushion	
55	345-2835-00	LED cushion	
56	345-2825-00	Rubber	
57	345-2824-00	Rubber	
58	286-4091-00	Setplate	
59	345-2689-00	Rubber	
60	345-2578-00	Rubber	
61	353-0108-00	Shade	
62	347-0696-00	Black paper	
63	347-0697-00	Black paper	
64	347-0337-00	Paper(Serial No.)	
65	347-0718-00	Insulator paper	
66	341-1152-00	Bush	
67	341-1101-00	Shaft	
68	335-0779-00	Panel rivet	
69	335-0787-00	Lead clamp	
70	321-0811-00	Clamp	
71	930-0451-00	Tape mechanism ass'y	
72	602-0045-00	Belt	2
73	850-1855-01	A-lead	
74	335-0725-00	A-lead clamp	
75	013-3156-03	Switch	2
76	013-3338-00	Switch	2
77	013-3339-00	Switch	2
78	013-3340-00	Switch	2
79	013-3349-00	Switch	2
80	013-3291-01	Switch	2
81	077-0071-00	Fuse receptacle	
82	120-0003-00	Fuse(0.3A)	1
83	287-1314-03	Name plate	
84	012-3291-00	Variable resistor	2
85	022-0030-06	Meter	2
86	023-0007-00	Counter	
87	075-0135-00	Jack	
88	075-0134-00	Jack	
89	075-0133-00	Jack	
90	076-0118-00	Plug	
91	008-0692-10	Power transformer	
92	746-0645-01	Special washer	
93	746-0679-00	Special washer	
94	716-0314-01	Special screw	

REF.NO.	PART NO.	DESCRIPTION	RANK	REF.NO.	PART NO.	DESCRIPTION	RANK
95	716-0322-00	Special screw		109	099-4901-00	P.W.B	
96	735-4010-11	Double sems screw		110	099-4902-00	P.W.B	
97	714-2612-19	Machine screw (M2.6x12)		111	099-4903-00	P.W.B	
98	714-2604-81	Machine screw (M2.6x4)		112	099-4904-00	P.W.B	
99	714-3006-81	Machine screw (M3x6)		113	099-4917-00	P.W.B	
100	731-3006-81	Taptight(M3x6)		114	099-4918-00	P.W.B	
101	702-3006-81	Tap-screw(M3x6)		115	099-4997-00	P.W.B	
102	702-3008-81	Tap-screw(M3x8)		116	285-0664-01	Guide label	
103	702-3008-89	Tap-screw(M3x8)		117	330-5911-00	Cover	
104	702-3008-41	Tap-screw(M3x8)		118	330-5912-01	Mounting bracket	
105	742-3000-21	Toothed washer		119	074-0526-01	Outlet socket	
106	740-3000-11	Flat washer		120	076-0159-00	Plug	
107	825-0211-00	Special tube		121	714-3008-81	Machine screw (M3x8)	
108	099-4900-00	P.W.B					

◎Electrical section

REF.NO.	PART NO.	D DESCRIPTION	RANK
$D_{101,102}$	001-0020-00	Diode(1N60)	3
$D_{108,301,302,303,401\sim405,601,802,805\sim821}$	001-0112-00	Diode(1S1588)	3
$D_{106,107}$	001-0141-00	Diode(1S2371A)	3
D_{804}	001-0169-01	Diode(05Z6.2)	3
$D_{103,104}$	001-0169-07	Diode(05Z11)	3
Q_{803}	100-0495-25	Transistor (2SA495Y)	1
$Q_{303,403}$	100-0509-25	Transistor (2SA509Y)	1
$Q_{614,615,714,715}$	100-0842-27	Transistor (2SA842)	1
$Q_{120,814,815}$	102-0496-25	Transistor (2SC496Y)	1
$Q_{304,404}$	102-0509-25	Transistor (2SC509Y)	1
$Q_{101\sim104,616,617,716,717}$	102-0732-27	Transistor (2SC732BL)	1
$Q_{115,105\sim108,114,201\sim206,610,611,710,711}$	102-0733-28	Transistor (2SC733GR)	1
$Q_{109\sim113,116\sim119,301\sim302,401\sim402,405\sim406,601\sim609,612\sim613,618\sim625,701\sim709,712\sim713,718\sim721,801\sim802,804\sim813}$	102-1815-25	Transistor (2SC1815Y(GR))	1
D_{105}	001-0189-00	Diode(S1QB10)	3
$D_{1\sim4,304,406,801}$	001-0186-00	Diode(10D-4)	3
$D_{501,503,505}$	001-0183-00	Diode(SLP131B)	3
$D_{502,504}$	001-0182-00	Diode(SLP231B)	3
$L_{607,608}$	010-1440-00	Coil	3
$L_{602,603,702,703}$	010-1681-00	Coil	3
$L_{605,606,705,706}$	010-1719-00	Coil	3
$L_{801,802}$	010-1808-00	Coil	3
$L_{601,604,701,704}$	010-1824-00	Coil	3
$VR_{601,602,605,606,701,702,705,706}$	012-3249-00	Variable resistor (30KΩB)	2
$VR_{603,604,703,704}$	012-3250-00	Variable resistor (500ΩB)	2
$VR_{101,102}$	012-3286-00	Variable resistor (1KΩB)	2
$VR_{607,608,707,708}$	012-3331-00	Variable resistor (100KΩB)	2
RY_1	014-0442-00	Relay	2
$C_{1,2}$	043-0022-00	Ceramic capacitor (0.04μF)	
$C_{3,4}$	043-0065-00	Ceramic capacitor (4700PF)	
$C_{816,822}$	043-0058-00	Polystylen capacitor (4700PF)	

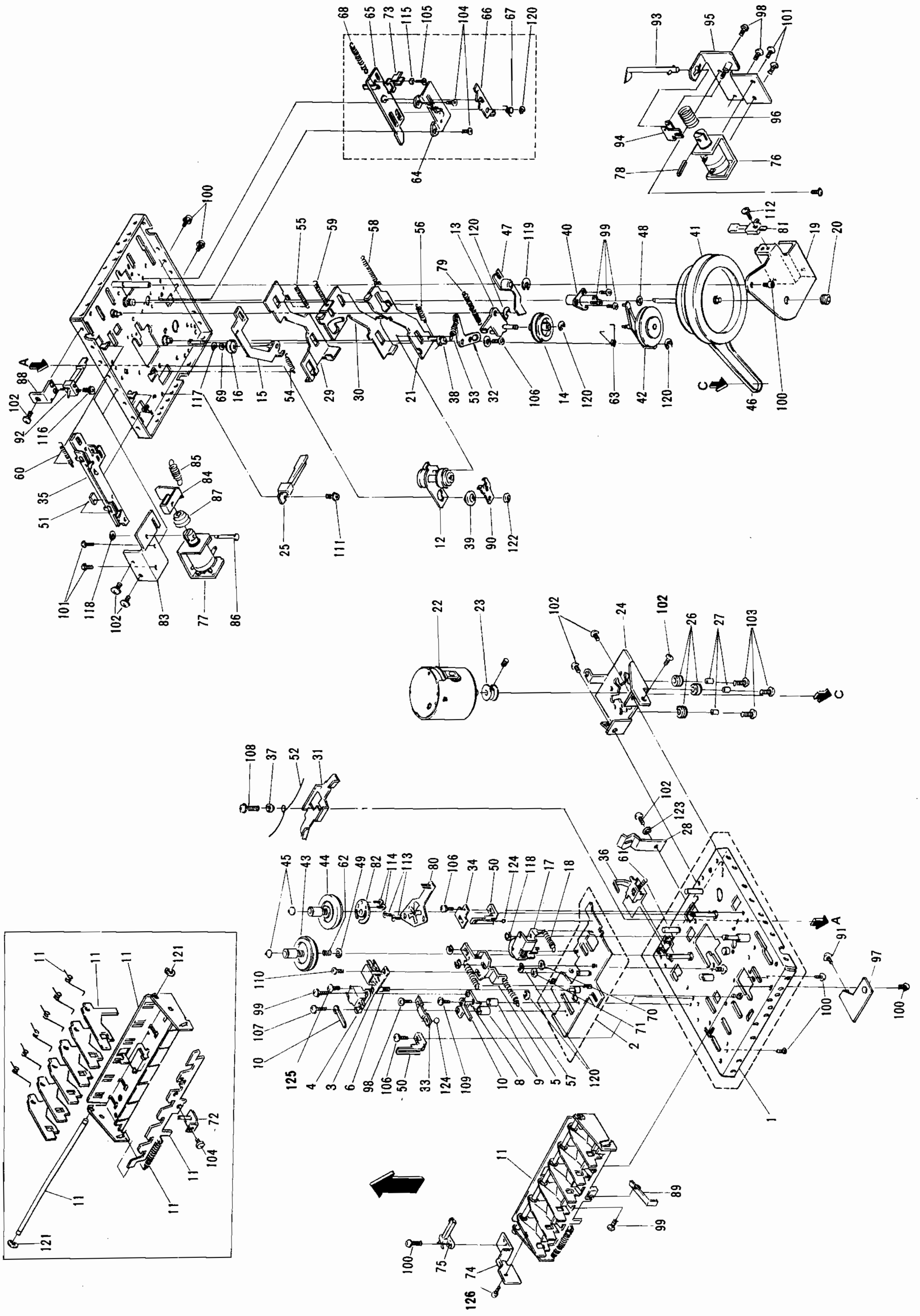
REF.NO.	PART NO.	DESCRIPTION	RANK
R_{414}	111-1001-31	Film resistor (¼W10Ω)	
$R_{314,640,737,740,842,846,637}$	111-1001-32	Film resistor (¼W10Ω)	
$R_{301,401}$	111-4721-31	Film resistor (¼W4.7KΩ)	
$R_{115,128,134,143,149,151,154,160,170,177,187,628,629,728,729,836,837}$	111-1021-32	Film resistor (¼W1KΩ)	
$R_{315,677}$	111-1031-31	Film resistor (¼W10KΩ)	
$R_{156,416,418,659,602,604,605,606,607,608,615,616,631,636,702,704,705,706,707,708,715,716,731,736,759,804,807,808,810,815,816,817,818,820,822,824,828,829,834,835,838,839,840,844}$	111-1031-32	Film resistor (¼W10KΩ)	
$R_{163,203,207,121,127,150,157,167,165,176,186,211,215,310,410,601,603,622,625,638,639,662,663,671,703,722,725,738,739,762,763}$	111-1041-32	Film resistor (¼W100KΩ)	
$R_{508,509}$	111-1011-32	Film resistor (¼W100Ω)	
$R_{611,612,617,618,711,712,717,718}$	111-1231-32	Film resistor (¼W12KΩ)	
$R_{105,112,119,125,674,675}$	111-1521-32	Film resistor (¼W1.5KΩ)	
$R_{173,182,192}$	111-1811-32	Film resistor (¼W180Ω)	
R_{831}	111-3321-31	Film resistor (¼W3.3KΩ)	
$R_{195,313,413}$	111-1821-32	Film resistor (¼W1.8KΩ)	
$R_{309,409,646,647,746,747}$	111-1831-32	Film resistor (¼W18KΩ)	
$R_{129,130,138,139,633,634,649,652,733,734,735,752}$	111-1841-32	Film resistor (¼W180KΩ)	
$R_{770,813}$	111-2211-32	Film resistor (¼W220Ω)	
$R_{225,226,228,230}$	111-2221-31	Film resistor (¼W2.2KΩ)	
$R_{101,108,137,146,174,184,227,229,801,802,803,806,809,811,819,821,823}$	111-2221-32	Film resistor (¼W2.2KΩ)	
$R_{160,190}$	111-1021-42	Film resistor (¼W1KΩ)	
$R_{132,141,136,145,162,172,179,189,805,812,814,825,827,832,833}$	111-2231-32	Film resistor (¼W22KΩ)	
$R_{104,111,102,109,118,124,133,142,204,208,212,216,220,224,641,644,645,648,669,670,678,679,741,744,745,748}$	111-2241-32	Film resistor (¼W220KΩ)	
$R_{158,168,306,307,406,407,667,668,768,841,845,767}$	111-2731-32	Film resistor (¼W27KΩ)	
$R_{107,114}$	111-3301-32	Film resistor (¼W33Ω)	
$R_{203,207,211,215,219,223,311,411}$	111-3321-32	Film resistor (¼W3.3KΩ)	
$R_{148,152,164,166,610,613,710,713,843,847}$	111-3331-32	Film resistor (¼W33KΩ)	
$R_{508,509}$	111-1041-31	Film resistor (¼W100KΩ)	

REF.NO.	PART NO.	DESCRIPTION	RANK
$R_{175,185,510,611}$	111-3921-32	Film resistor (¼W3.9KΩ)	
$R_{131,140,632,635,732,735}$	111-3931-32	Film resistor (¼W39KΩ)	
$R_{312,412}$	111-4701-32	Film resistor (¼W47Ω)	
$R_{655,656,755,756}$	111-4711-32	Film resistor (¼W470Ω)	
$R_{178,188,302,305,402,405,619,620,627,664,630,660,645,719,720,727,730,760,745,764}$	111-4721-32	Film resistor (¼W4.7KΩ)	
$R_{159,169}$	111-1641-32	Film resistor (¼W160KΩ)	
$R_{103,110,117,123,303,304,403,404}$	111-4731-32	Film resistor (¼W47KΩ)	
$R_{194,769}$	111-5611-32	Film resistor (¼W560Ω)	
$R_{106,113,120,126,135,144,161,171,316,308,415,408,654,657,661,665,673,676,754,757,761,765}$	111-5621-32	Film resistor (¼W5.6KΩ)	
$R_{621,626,721,726}$	111-5631-32	Film resistor (¼W56KΩ)	
$R_{218,222,671,672}$	111-5641-32	Film resistor (¼W560KΩ)	
$R_{181,191,609,614,650,651,709,714,750,751}$	111-6801-32	Film resistor (¼W68Ω)	
R_{317}	111-6811-31	Film resistor (¼W680Ω)	
R_{417}	111-6811-32	Film resistor (¼W680Ω)	
$R_{116,122}$	111-1631-32	Film resistor (¼W16KΩ)	
$R_{623,624,723,724}$	111-6821-32	Film resistor (¼W6.8KΩ)	
$R_{202,206,210,214,653,658,753,758}$	111-6831-32	Film resistor (¼W68KΩ)	
$R_{183,193}$	111-8201-32	Film resistor (¼W82Ω)	
$R_{217,221,642,643,742,743}$	111-8231-32	Film resistor (¼W82KΩ)	
$R_{502,507}$	114-1812-51	Film resistor (1W180Ω)	
$R_{503,504,505}$	114-8212-51	Film resistor (1W820Ω)	
$R_{501,506}$	114-3912-51	Film resistor (1W390Ω)	
$C_{120,124,210,213,627,628,655,656,727,728}$	141-1022-12	Polyester capacitor (50V0.001μF)	
$C_{814,820}$	141-1032-12	Polyester capacitor (50V0.01μF)	
$C_{604,609,643,645,704,709,743,745}$	141-1532-13	Polyester capacitor (50V0.015μF)	
$C_{635,640,735}$	141-1832-13	Polyester capacitor (50V0.018μF)	
$C_{813,819}$	141-2222-12	Polyester capacitor (50V0.0022μF)	
$C_{606,607,706,707}$	141-2232-13	Polyester capacitor (50V0.022μF)	
$C_{605,608,705,708}$	141-2732-14	Polyester capacitor (50V0.027μF)	

REF.NO.	PART NO.	DESCRIPTION	RANK
$C_{621,622,721,722}$	141-4732-14	Polyester capacitor (50V0.047μF)	
$C_{625,626,725,726}$	141-5112-11	Polyester capacitor (50V510PF)	
$C_{815,821}$	141-6822-12	Polyester capacitor (50V0.0068μF)	
$C_{112,116,122,126,636,639,736,739}$	144-2002-11	Mica capacitor (50V20PF)	
$C_{623,624,654,657,723,724}$	144-2212-17	Mica capacitor (50V220PF)	
$C_{102,106,138,144,615,618,715,718}$	144-4702-12	Mica capacitor (50V47PF)	
$C_{501,502,503,504,505,506}$	165-3935-01	Ceramic capacitor (50V0.039μF)	
$C_{601,602,603,610,616,641,644,651,130,133,137,145,147,141,139,202,204,206,208,211,214,306,304,404,701,702,703,715,741,744,808,809,810,143}$	180-1064-32	Electrolytic capacitor (16V10μF)	
$C_{114,118,125,127,132,135,620,619,653,652,104,108,719,720,742,746,642,646}$	180-1064-42	Electrolytic capacitor (25V10μF)	
$C_{108,107}$	180-1074-22	Electrolytic capacitor (10V100μF)	
$C_{302,303,402,403,407,408,802,805}$	180-1074-32	Electrolytic capacitor (16V100μF)	
$C_{109,110,119,811,812,817,818}$	180-1074-42	Electrolytic capacitor (25V100μF)	
$C_{151,152}$	180-1084-42	Electrolytic capacitor (25V1000μF)	
$C_{612,613,712,713}$	180-2264-22	Electrolytic capacitor (10V22μF)	
$C_{305,405}$	180-2274-32	Electrolytic capacitor (16V220μF)	
$C_{149,747,748}$	180-2274-42	Electrolytic capacitor (25V220μF)	
$C_{140,146}$	180-3364-32	Electrolytic capacitor (16V33μF)	
$C_{201,203,205,207,212,209,307,406,611,614,647,648,136,142,711,806,807}$	180-4754-42	Electrolytic capacitor (25V4.7μF)	
$C_{129,131,134,128,716,717,617,616,649,650,113,117}$	180-4764-22	Electrolytic capacitor (10V47μF)	
C_{801}	180-4764-32	Electrolytic capacitor (16V47μF)	
C_{148}	180-4774-42	Electrolytic capacitor (25V470μF)	
C_{150}	180-4774-52	Electrolytic capacitor (35V470μF)	
$C_{101,105,111,115,121,125}$	181-1063-42	Electrolytic capacitor (25V10μF)	
$C_{633,634,637,638,733,734,737,738}$	181-1073-22	Electrolytic capacitor (10V100μF)	
$C_{630,631,730,731,804}$	181-4753-42	Electrolytic capacitor (25V4.7μF)	
$C_{215,629,632,723,729}$	181-4763-42	Electrolytic capacitor (25V47μF)	

■EXPLODED VIEW:

◎Mechanism section


68
65
73
115
105
104
66
67
120
64
93
95
98
101
96
94
78
76
100
55
59
58
56
13
120
47
119
40
99
48
41
112
81
19
20
79
102
88
A
92
116
60
35
51
117
69
16
15
54
29
30
21
38
53
32
106
14
120
63
42
120
C
46
100
85
84
87
25
111
12
39
90
122
101
118
102
83
77
86
22
23
102
24
102
26
27
103
C
108
37
52
31
102
123
28
36
61
45
43
44
62
49
82
114
113
80
106
34
50
124
118
17
18
A
91
97
100
100
110
99
107
10
125
4
3
6
98
106
50
33
124
109
10
8
9
5
57
120
2
71
70
100
1
11
11
11
121
72
104
11
11
11
121
11
89
99
100
75
74
126

■PARTS LIST:

◎Mechanism section

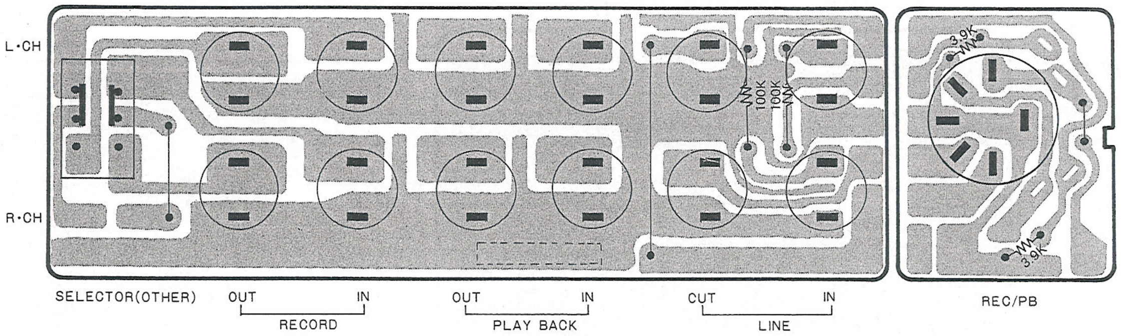
REF.NO.	PART NO.	DESCRIPTION	RANK
1	658-0102-01	Mechanism chassis caulked part	
2	658-0102-02	Head panel caulked part	
3	011-0234-00	Recording head	2
4	011-0235-00	Erasing head	2
5	658-0101-03	Panel operation plate	
6	658-0101-06	Recording head spring B	
7	658-0101-07	Panel operation spring C	
8	658-0101-10	Erasing head base B	
9	658-0101-11	Erasing stand	
10	658-0111-12	Lead fixing lug	
11	658-0102-03	Push button fram Ass'y	
12	658-0102-04	FF idler Ass'y C	
13	658-0102-05	Auto drive plate(B) caulked part	
14	658-0102-06	REW idler	
15	658-0101-15	REW arm(B) caulked part	
16	658-0101-16	REW idler	
17	658-0101-17	Pinch roller Ass'y	
18	658-0101-18	Pinch roller spring	
19	658-0102-07	Flywheel carrier plate	
20	658-0101-20	Adjusting screw	
21	658-0101-21	FF arm(B) caulked part	
22	020-0338-00	Motor	1
23	658-0101-22	Motor pulley	
24	658-0102-08	Holder(F)	
25	658-0101-24	Leaf switch	2
26	658-0101-25	Rubber cushion	
27	658-0101-26	Collar	
28	658-0102-09	Pack receive spring plate B	
29	658-0102-10	Brake lever	
30	658-0101-30	REW lever	
31	658-0101-31	Brake arm	
32	658-0101-32	FF tension arm	
33	658-0101-33	Panel support(A)	
34	658-0101-34	Panel support(D)	
35	658-0101-35	Record safety lever(A)	
36	658-0101-36	Record safety lever(C)	
37	658-0101-37	Brake arm collar	
38	658-0101-38	Tension arm collar	
39	658-0102-11	FF idler arm shaft	
40	658-0102-12	Bearing	
41	658-0102-13	Flywheel	
42	658-0101-41	Clutch Ass'y	
43	658-0101-43	Reel brace (R) Ass'y	3
44	658-0102-14	Reel brace (L) Ass'y	3
45	658-0101-44	Reel cap	
46	658-0101-45	Drive belt	1
47	658-0101-47	Auto lever	
48	658-0101-48	2.5φ washer	
49	658-0101-49	6φ washer	
50	658-0101-50	Cassette guide(E)	
51	658-0101-51	Cushion(A)	
52	658-0101-52	Brake arm spring	
53	658-0101-53	FF idler spring	
54	658-0101-54	REW arm spring	
55	658-0101-55	Brake lever spring	
56	658-0102-15	REW tension spring	
57	658-0101-56	Head panel spring	
58	658-0101-57	FF arm spring	
59	658-0101-58	REW lever spring	
60	658-0101-59	REC lever spring(A)	
61	658-0101-60	REC lever spring(B)	
62	658-0102-16	REW reel spring(B)	
63	658-0101-62	Clutch arm spring	
64	658-0101-64	Pause base caulked part	
65	658-0101-65	Pause arm caulked part	
66	658-0101-66	Pause cam(B)	
67	658-0101-67	Pause cam spring	
68	658-0101-68	Pause arm spring	
69	658-0102-17	2φ polyester slider washer	
70	658-0102-18	3φ polyester slider washer	
71	658-0102-19	4φ polyester slider washer	
72	658-0101-73	Auto stop operating plate Ass'y	
73	658-0101-74	Pause support metal (B)	
74	658-0102-20	Muting switch mount	
75	658-0102-21	Muting switch	
76	658-0101-75	Solenoid	2
77	658-0102-22	Solenoid	2
78	658-0102-23	Spring pin	
79	658-0102-24	Auto idler plate spring	
80	658-0102-25	Switch printed board	
81	658-0102-26	Leaf switch	2
82	658-0102-27	Slider	
83	658-0102-28	Plunger mount	
84	658-0102-29	Plunger lever	
85	658-0102-30	Plunger operating spring	
86	658-0102-31	Plunger lever shaft	
87	658-0102-32	Solenoid spring	
88	658-0102-33	REW switch mounting metal	
89	658-0102-34	REW lever metal	
90	658-0101-79	FF idler arm support	
91	658-0102-41	Cassette case cushion B	
92	658-0102-35	Leaf switch	2
93	658-0102-36	Timer slide lever	
94	658-0102-37	Timer lever	

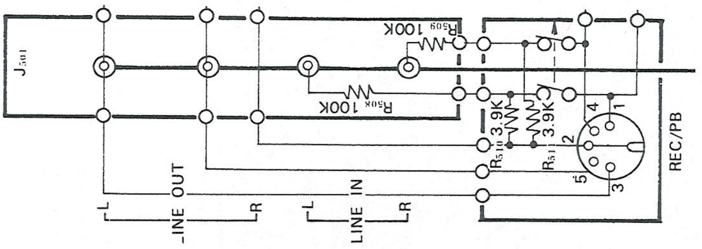
REF.NO.	PART NO.	DESCRIPTION	RANK
95	658-0102-38	Timer REC mounting plate caulked part	
96	658-0102-39	Solenoid spring(G)	
97	658-0102-40	Mechanism cushion metal	
98	732-2604-11	Sems screw (M2.6x4)	
99	732-2005-11	Sems screw (M2x5)	
100	732-2605-11	Sems screw (M2.6x5)	
101	732-3004-11	Sems screw (M3x4)	
102	731-3005-11	Taptight(M3x5)	
103	737-2606-11	Sems screw (M2.6x6)	
104	714-2603-11	Macine screw (M2.6x3)	
105	714-2003-11	Machine screw (M2x3)	
106	732-2606-11	Sems screw (M2.6x6)	
107	732-2016-11	Sems screw (M2x16)	
108	732-2610-11	Sems screw (M2.6x10)	
109	732-2013-11	Sems screw (M2x13)	
110	732-2004-11	Sems screw (M2x4)	

REF.NO.	PART NO.	DESCRIPTION	RANK
111	732-2604-11	Sems screw (M2.6x4)	
112	732-2608-11	Sems screw (M2.6x8)	
113	658-0102-42	Machine screw (M2x2.5)	
114	658-0102-43	Machine screw (M1.7x1.8)	
115	741-2000-21	Spring washer(M2)	
116	732-3010-11	Sems screw (M3x10)	
117	743-1500-01	E-ring(M1.5)	
118	743-2000-01	E-ring(M2.0)	
119	743-4000-01	E-ring(M4.0)	
120	743-2500-01	E-ring(M2.5)	
121	743-3000-01	E-ring(M3.0)	
122	723-2600-11	Hex. nut(M2.6)	
123	741-3000-20	Spring washer(M3)	
124	760-1102-00	Steel ball	
125	658-0102-44	Special screw (M2x5)	
126	731-2605-11	Taptight(M2.6x5)	

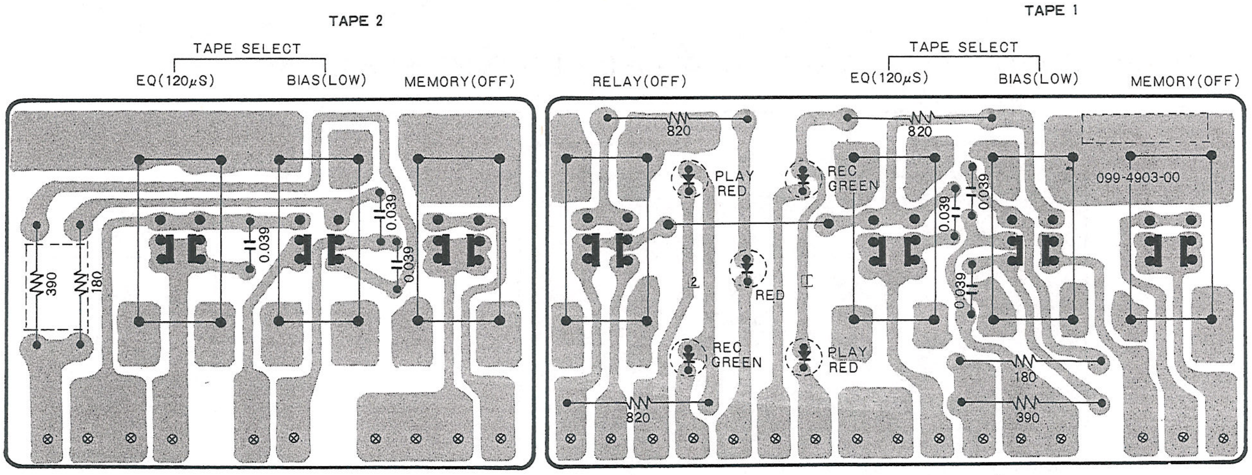
■PRINTED WIRING BOARD: SCHEMATIC DIAGRAM:

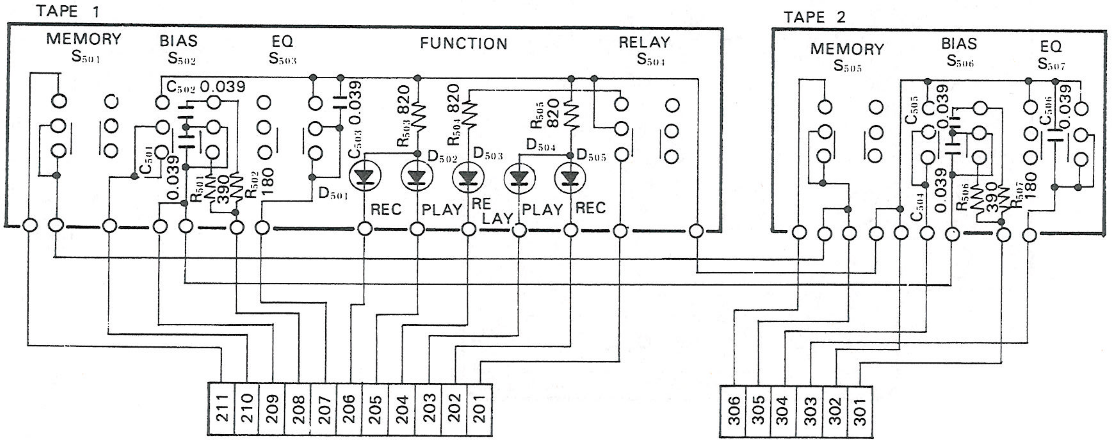
◎CONNECTOR WIRING BOARD


L·CH
R·CH
3.9K
100K
100K
3.9K
SELECTOR(OTHER)
OUT
IN
RECORD
OUT
IN
PLAY BACK
CUT
IN
LINE
REC/PB

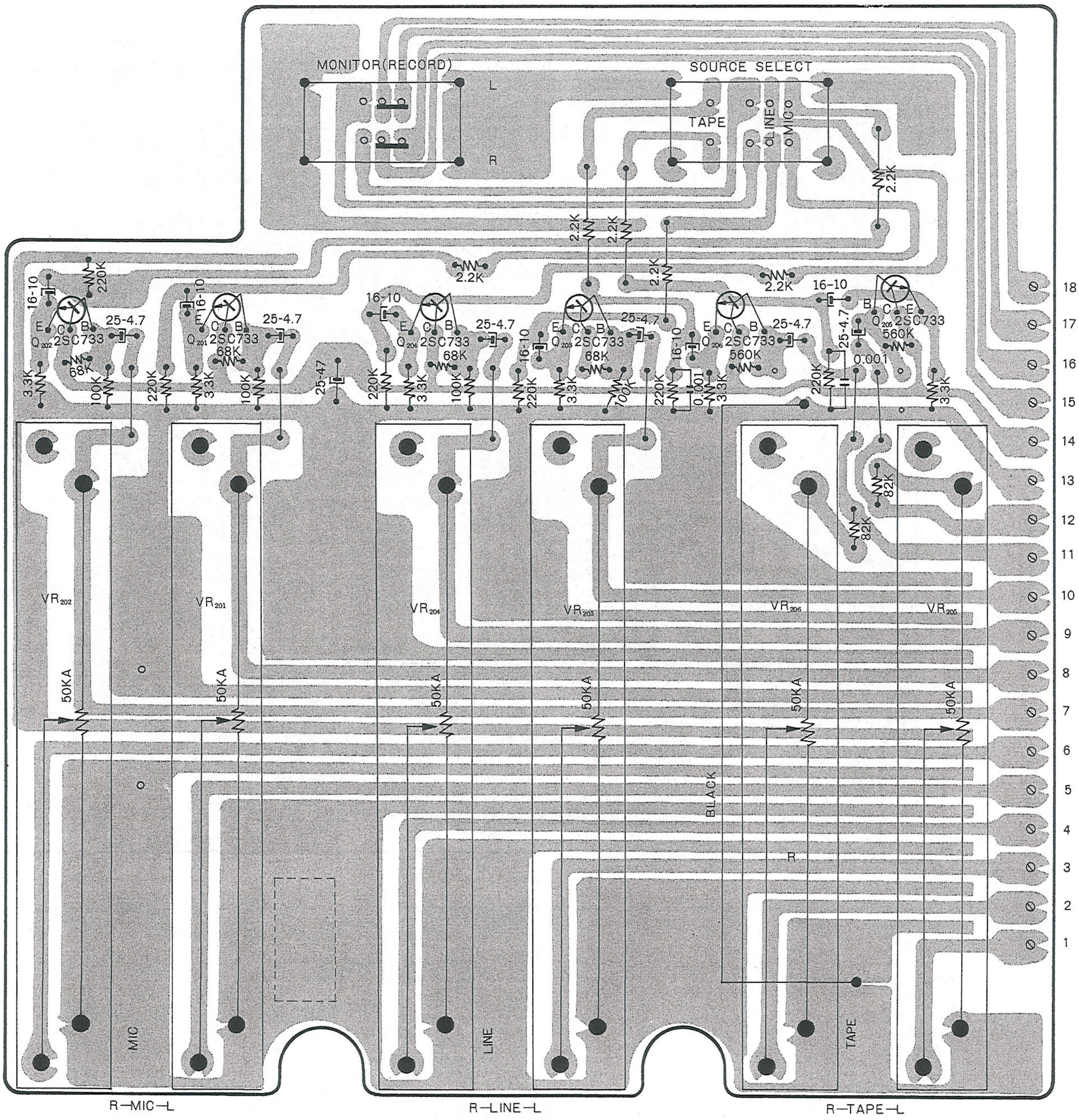

J501
R509 100K
R508 100K
R510 3.9K
R511 3.9K
1
2
3
4
5
REC/PB
L
OUT
R
LINE
L
IN
R
LINE

◎SELECT CIRCUIT WIRING BOARD

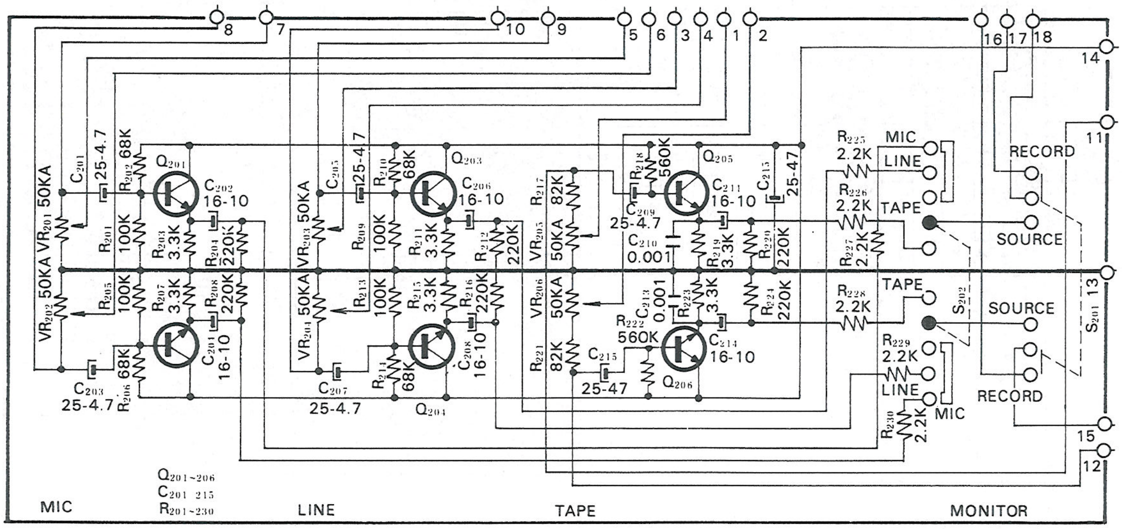

TAPE 2
TAPE SELECT
EQ(120μS)
BIAS(LOW)
MEMORY(OFF)
390
180
0.039
0.039
0.039
RELAY(OFF)
TAPE 1
TAPE SELECT
EQ(120μS)
BIAS(LOW)
MEMORY(OFF)
820
820
PLAY RED
REC GREEN
RED
REC GREEN
PLAY RED
0.039
0.039
0.039
099-4903-00
180
390
820


TAPE 1
MEMORY S501
BIAS S502
EQ S503
FUNCTION
RELAY S504
C502 0.039
C501 0.039
R501 390
R502 180
0.039
C503
R503 820
R504 820
R505 820
D501
D502
D503
D504
D505
REC
PLAY
RELAY
PLAY
REC
TAPE 2
MEMORY S505
BIAS S506
EQ S507
C505 0.039
C504 0.039
R506 390
R507 180
C506 0.039
211
210
209
208
207
206
205
204
203
202
201
306
305
304
303
302
301

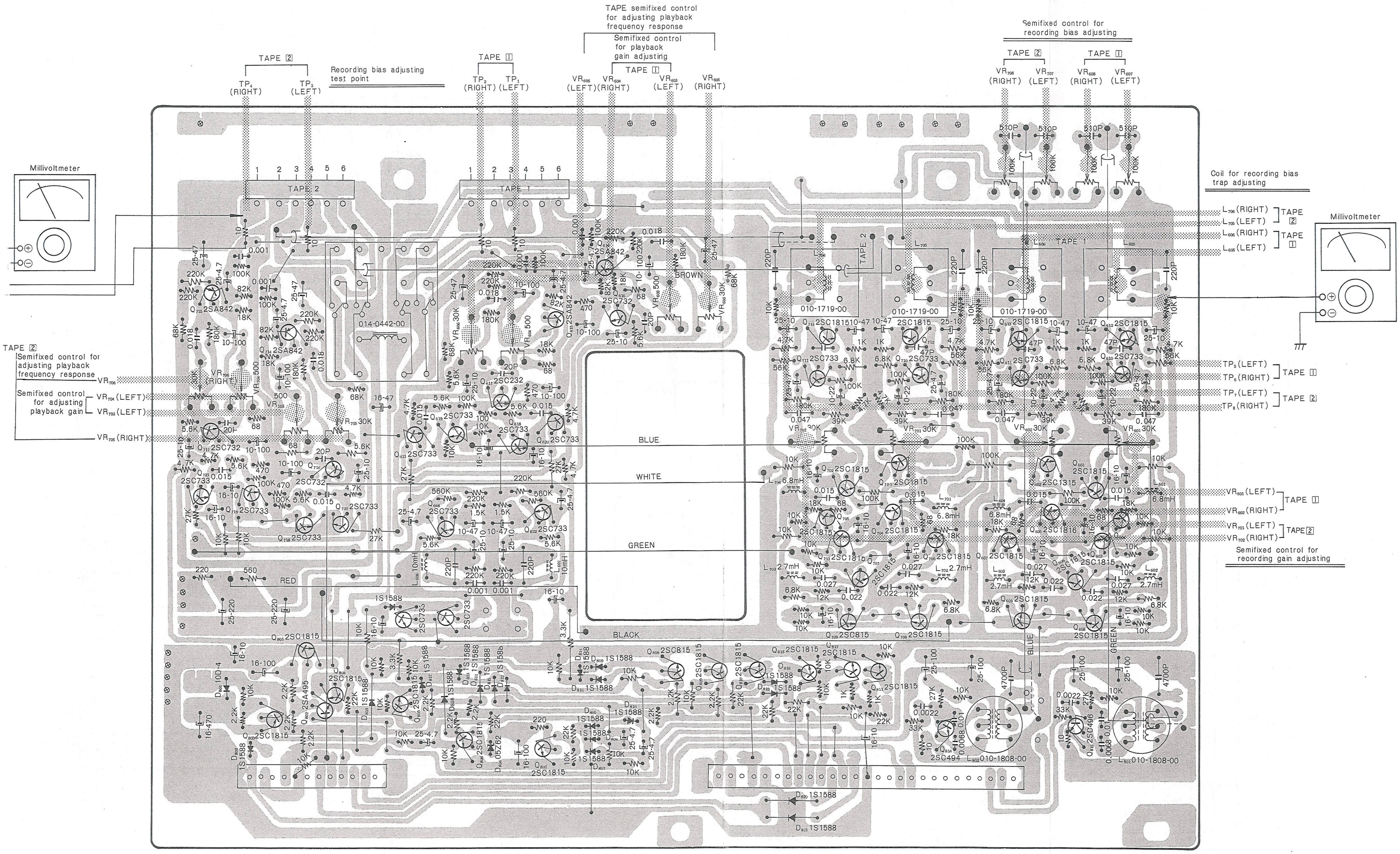
◎VOLUME CONTROL WIRING BOARD



MONITOR(RECORD)
L
R
SOURCE SELECT
TAPE
LINE
MIC
2.2K
220K
16-10
25-4.7
Q202 2SC733
Q201 2SC733
Q204 2SC733
Q203 2SC733
Q206 2SC733
Q205 2SC733
E C B
68K
3.3K
100K
220K
25-47
560K
700K
0.001
82K
VR202
VR201
VR204
VR203
VR206
VR205
50KA
BLACK
R
MIC
LINE
TAPE
R—MIC—L
R—LINE—L
R—TAPE—L
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

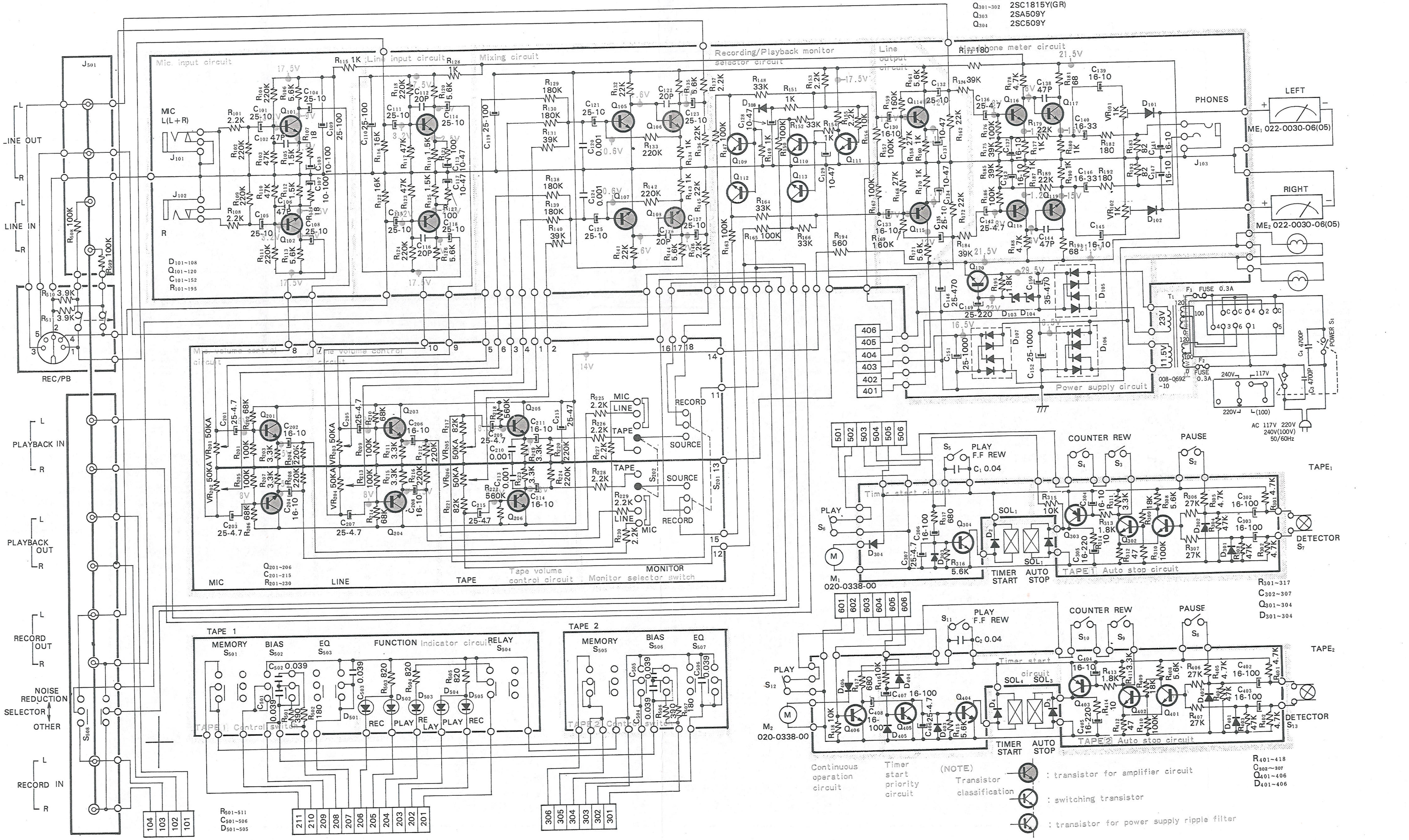


8
7
10
9
5
6
3
4
1
2
16
17
18
14
11
13
15
12
VR201 50KA
VR202 50KA
C201 25-4.7
R202 68K
Q201
C202 16-10
R201 100K
R203 3.3K
R204 220K
R205
R207 3.3K
R208 220K
R206 68K
C204 16-10
C203 25-4.7
VR203 50KA
VR204 50KA
C205 25-4.7
R210 68K
Q203
C206 16-10
R209 100K
R211 3.3K
R212 220K
R213 100K
R215 3.3K
R216 220K
R214 68K
C208 16-10
C207 25-4.7
Q204
R217 82K
VR205 50KA
VR206 50KA
R221 82K
R218 560K
Q205
C209 25-4.7
C210 0.001
C211 16-10
C215 25-47
R219 3.3K
R220 220K
R222 560K
C213 0.001
R223 3.3K
R224 220K
C215 25-47
C214 16-10
Q206
R225 2.2K
R226 2.2K
R227 2.2K
R228 2.2K
R229 2.2K
R230 2.2K
MIC
LINE
TAPE
SOURCE
RECORD
S202
S201
Q201~206
C201 215
R201~230
MIC
LINE
TAPE
MONITOR

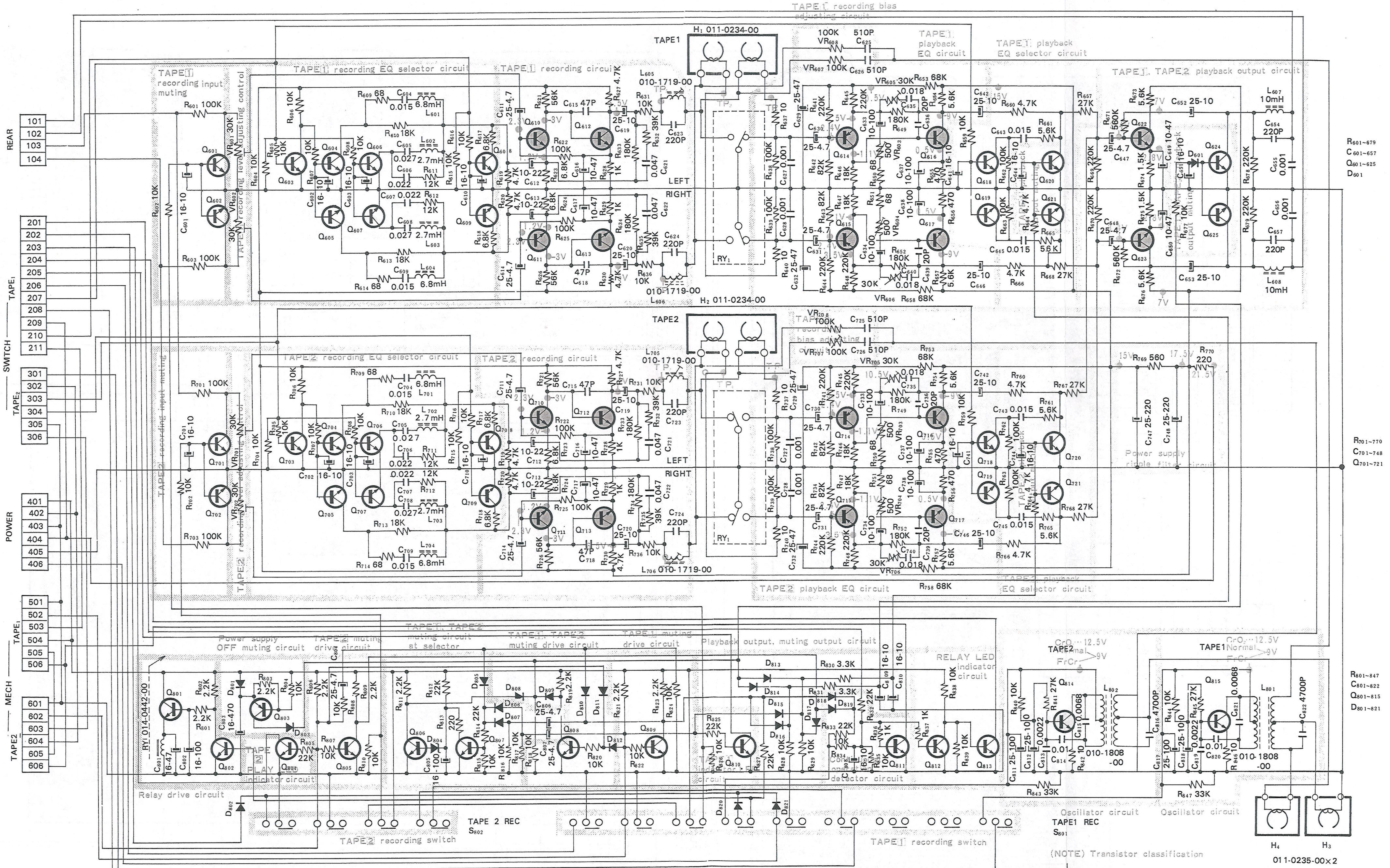

TAPE semifixed control for adjusting playback frequency response
Semifixed control for playback gain adjusting
TAPE 2
TP4 (RIGHT)
TP3 (LEFT)
Recording bias adjusting test point
TAPE 1
TP2 (RIGHT)
TP1 (LEFT)
VR606 (LEFT)
VR604 (RIGHT)
TAPE 1
VR603 (LEFT)
VR605 (RIGHT)
Semifixed control for recording bias adjusting
TAPE 2
TAPE 1
VR708 (RIGHT)
VR707 (LEFT)
VR608 (RIGHT)
VR607 (LEFT)
Millivoltmeter
Coil for recording bias trap adjusting
L706 (RIGHT)
L705 (LEFT)
TAPE 2
L606 (RIGHT)
L605 (LEFT)
TAPE 1
Millivoltmeter
TAPE 2
Semifixed control for adjusting playback frequency response
VR706
Semifixed control for adjusting playback gain
VR704 (LEFT)
VR703 (LEFT)
VR705 (RIGHT)
TP5 (LEFT)
TP6 (RIGHT)
TAPE 1
TP7 (LEFT)
TP8 (RIGHT)
TAPE 2
VR601 (LEFT)
VR602 (RIGHT)
TAPE 1
VR701 (LEFT)
VR702 (RIGHT)
TAPE 2
Semifixed control for recording gain adjusting
TAPE 2
TAPE 1
BLUE
WHITE
GREEN
RED
BLACK
BROWN
010-1719-00
014-0442-00
010-1808-00

■OVERALL SCHEMATIC DIAGRAM:

$D_{1\sim4}$	001-0186-00	$D_{301\sim303}$	001-0112-00	$Q_{101\sim104}$	2SC732BL	$Q_{401\sim402}$	2SC1815Y(GR)
$D_{101\sim102}$	001-0020-00	D_{304}	001-0186-00	$Q_{105\sim108}$	2SC733GR(BL)	Q_{403}	2SA509Y
$D_{103\sim104}$	001-0169-07	$D_{401\sim405}$	001-0112-00	$Q_{109\sim113}$	2SC1815Y(GR)	Q_{404}	2SC509Y
D_{105}	001-0189-00	D_{406}	001-0186-00	$Q_{114\sim115}$	2SC733GR(BL)	$Q_{405\sim406}$	2SC1815Y(GR)
$D_{106\sim107}$	001-0141-00	$D_{501,503,505}$	001-0183-00	$Q_{116\sim119}$	2SC1815Y(GR)		
D_{108}	001-0112-00	$D_{502,504}$	001-0182-00	Q_{120}	2SC496Y		
				$Q_{201\sim206}$	2SC733GR(BL)		
				$Q_{301\sim302}$	2SC1815Y(GR)		
				Q_{303}	2SA509Y		
				Q_{304}	2SC509Y		

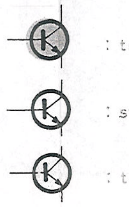

J501
LINE OUT
L
R
LINE IN
REC/PB
PLAYBACK IN
PLAYBACK OUT
RECORD OUT
NOISE REDUCTION SELECTOR
OTHER
RECORD IN
S508
Mic input circuit
MIC L(L+R)
J101
J102
R
Line input circuit
Mixing circuit
Recording/Playback monitor selector circuit
Line output circuit
Headphone meter circuit
21.5V
17.5V
PHONES
LEFT
RIGHT
ME1 022-0030-06(05)
ME2 022-0030-06(05)
J103
D101~108
Q101~120
C101~152
R101~195
406
405
404
403
402
401
Power supply circuit
008-0692-10
FUSE 0.3A
T1
AC 117V 220V 240V(100V) 50/60Hz
POWER S1
Mic volume control circuit
Line volume control circuit
Tape volume control circuit
Monitor selector switch
MIC
LINE
TAPE
MONITOR
RECORD
SOURCE
Q201~206
C201~215
R201~230
TAPE 1
MEMORY S501
BIAS S502
EQ S503
FUNCTION Indicator circuit
RELAY S504
TAPE 1 Control switch
REC
PLAY
RELAY
TAPE 2
MEMORY S505
BIAS S506
EQ S507
TAPE 2 Control switch
R501~511
C501~506
D501~505
104 103 102 101
211 210 209 208 207 206 205 204 203 202 201
306 305 304 303 302 301
501 502 503 504 505 506
601 602 603 604 605 606
PLAY F.F REW
COUNTER REW
PAUSE
TAPE1
TAPE2
DETECTOR
Timer start circuit
SOL1
SOL2
SOL3
SOL4
TIMER START
AUTO STOP
TAPE 1 Auto stop circuit
TAPE 2 Auto stop circuit
M1 020-0338-00
M2 020-0338-00
R301~317
C302~307
Q301~304
D301~304
R401~418
C402~407
Q401~406
D401~406
Continuous operation circuit
Timer start priority circuit
(NOTE) Transistor classification
: transistor for amplifier circuit
: switching transistor
: transistor for power supply ripple filter

OVERALL SCHEMATIC DIAGRAM:


TAPE1 recording bias adjusting circuit
TAPE1 H1 011-0234-00
TAPE1 playback EQ circuit
TAPE1 playback EQ selector circuit
TAPE1 recording input muting
TAPE1 recording level adjusting control
TAPE1 recording EQ selector circuit
TAPE1 recording circuit
TAPE1, TAPE2 playback output circuit
L605 010-1719-00
L606 010-1719-00
H2 011-0234-00
LEFT
RIGHT
RY1
TAPE2
TAPE2 recording bias adjusting circuit
TAPE2 recording input muting
TAPE2 recording EQ selector circuit
TAPE2 recording circuit
L705 010-1719-00
L706 010-1719-00
TAPE2 playback EQ circuit
TAPE2 playback EQ selector circuit
Power supply ripple filter circuit
REAR
101
102
103
104
SWITCH
TAPE1
201
202
203
204
205
206
207
208
209
210
211
TAPE2
301
302
303
304
305
306
POWER
401
402
403
404
405
406
MECH
TAPE1
501
502
503
504
505
506
TAPE2
601
602
603
604
605
606
R601~679
C601~657
Q601~625
D601
R701~770
C701~748
Q701~721
R801~847
C801~822
Q801~815
D801~821
Power supply OFF muting circuit
TAPE2 muting drive circuit
TAPE1, TAPE2 muting circuit at selector
TAPE1, TAPE2 muting drive circuit
TAPE1 muting drive circuit
Playback output, muting output circuit
RELAY LED indicator circuit
RY1 014-0442-00
TAPE2 PLAY indicator circuit
Relay drive circuit
Control detector circuit
TAPE 2 REC S802
TAPE2 recording switch
TAPE1 recording switch
TAPE2 CrO2 12.5V Normal 9V FrCr
TAPE1 CrO2 12.5V Normal 9V FrCr
L802 010-1808-00
L801 010-1808-00
R843 33K
R847 33K
Oscillator circuit
Oscillator circuit
TAPE1 REC S801
H4
H3
011-0235-00×2

$Q_{601\sim609}$	2SC1815Y(GR)	$Q_{701\sim709}$	2SC1815Y(GR)	$Q_{801\sim802}$	2SC1815Y(GR)	D_{601}	001-0112-00
$Q_{610\sim611}$	2SC733GR(BL)	$Q_{710\sim711}$	2SC733GR(BL)	Q_{803}	2SA495Y	D_{801}	001-0186-00
$Q_{612\sim613}$	2SC1815Y(GR)	$Q_{712\sim713}$	2SC1815Y(GR)	$Q_{804\sim813}$	2SC1815Y(GR)	$D_{802\sim803}$	001-0112-00
$Q_{614\sim615}$	2SA842BL	$Q_{714\sim715}$	2SA842BL	$Q_{814\sim815}$	2SC496Y	D_{804}	001-0169-01
$Q_{616\sim617}$	2SC732BL	$Q_{716\sim717}$	2SC732BL			$D_{805\sim821}$	001-0112-00
$Q_{618\sim625}$	2SC1815Y(GR)	$Q_{718\sim721}$	2SC1815Y(GR)				

(NOTE) Transistor classification

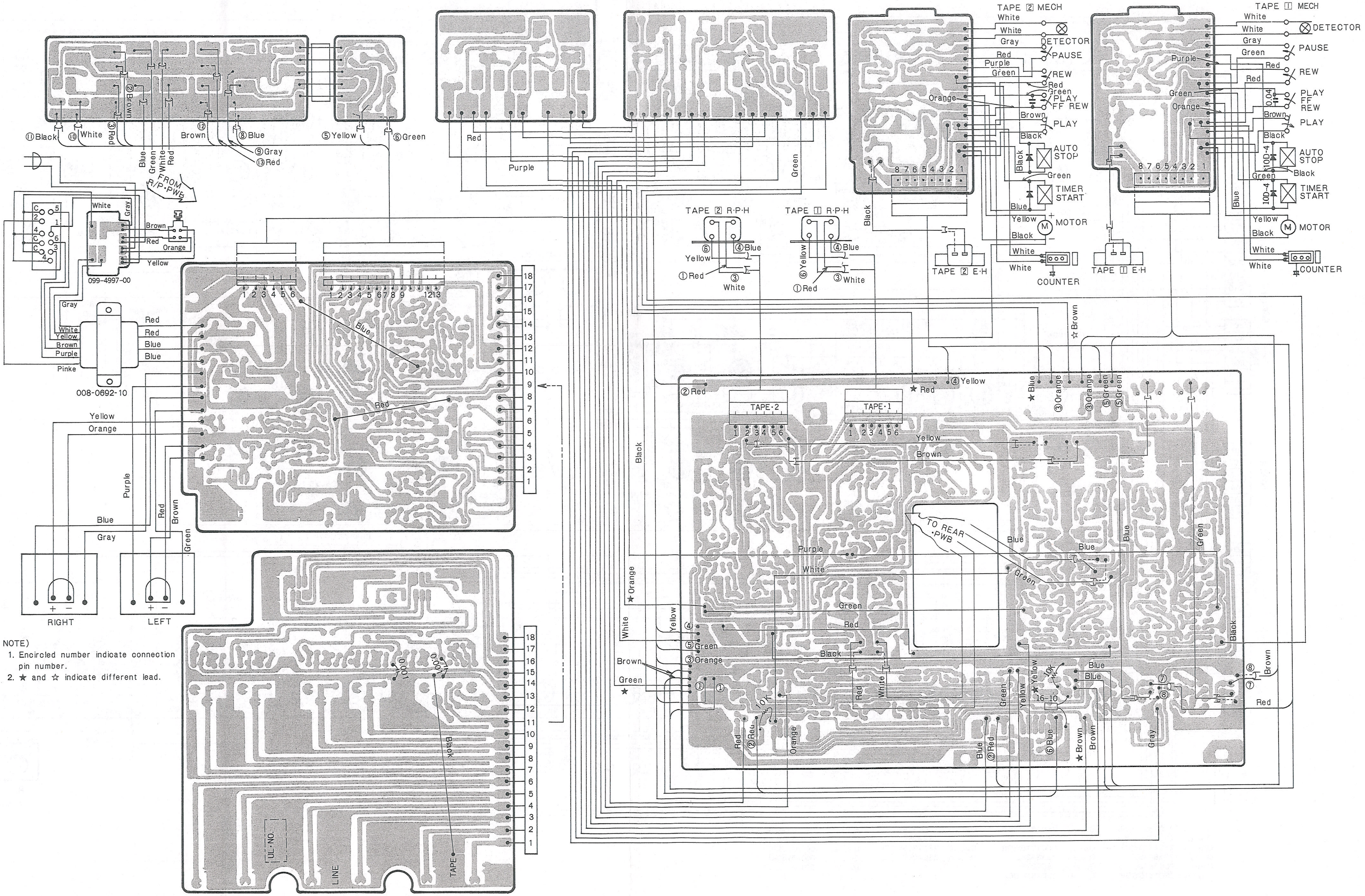


: transistor for amplifier circuit

: switching transistor

: transistor for oscillator circuit

■SUBSTANCE WIRING BOARD:


①Black
⑩White
③Red
②Brown
Blue
Green
White
Red
⑫ Brown
⑧Blue
⑨Gray
⑬Red
⑤Yellow
⑥Green
FROM R/P·PWB
White
Gray
Brown
Red
Orange
Yellow
099-4997-00
Gray
White
Yellow
Brown
Purple
Pinke
Red
Red
Blue
Blue
008-0692-10
Yellow
Orange
Purple
Blue
Gray
Red
Brown
Green
+ −
RIGHT
+ −
LEFT
Red
Purple
Green
Blue
1 2 3 4 5 6
1 2 3 4 5 6 7 8 9 12 13
18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
100-4
100-4
Black
UL. NO.
LINE
TAPE
TAPE ② MECH
White
White
Gray
DETECTOR
Red
PAUSE
Purple
Green
REW
Red
Green
PLAY
FF REW
Orange
Brown
PLAY
Black
AUTO STOP
Black
Green
TIMER START
Blue
Yellow
MOTOR
Black
White
White
COUNTER
8 7 6 5 4 3 2 1
TAPE ① MECH
White
White
DETECTOR
Gray
Green
PAUSE
Purple
Red
REW
Red
Green
PLAY
FF
REW
Orange
Brown
PLAY
Black
100-4
AUTO STOP
Black
Green
100-4
TIMER START
Blue
Yellow
MOTOR
Black
White
White
COUNTER
TAPE ② R·P·H
⑥ Yellow
④Blue
①Red
③ White
TAPE ① R·P·H
⑥Yellow
④Blue
①Red
③White
Black
TAPE ② E·H
TAPE ① E·H
☆Brown
②Red
★Red
④Yellow
★Blue
③Orange
③Orange
⑤Green
⑤Green
TAPE·2
TAPE·1
1 2 3 4 5 6
1 2 3 4 5 6
Yellow
Brown
Black
TO REAR ·PWB
Purple
White
Blue
Blue
Blue
Green
Green
★Orange
White
Yellow
Green
Red
Black
Black
④
⑤Green
③Orange
①
①
Brown
Green
★
Red
White
10K
10K
16-10
Yellow
★Yellow
Blue
Blue
⑦
⑧
⑧
⑦
Brown
Red
Red
②Red
Orange
Green
Yellow
Blue
②Red
⑥Blue
★Brown
Brown
Gray

NOTE)
1. Encircled number indicate connection pin number.
2. ★ and ☆ indicate different lead.